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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,523	02/15/2002	Shixin Chen	09819-004001	3603
26161	7590	12/16/2004	EXAMINER	
FISH & RICHARDSON PC 225 FRANKLIN ST BOSTON, MA 02110			MAGEE, CHRISTOPHER R	
			ART UNIT	PAPER NUMBER
			2653	

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/077,523

Applicant(s)

CHEN ET AL.

Examiner

Christopher R. Magee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 18, ~~20~~ 21 and 24-30 is/are rejected.
- 7) ☒ Claim(s) 17, ~~19~~ 22 and 23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

3. Claim 12 is objected to because of the following informalities: In claim 12, "said element" should be --said piezoelectric element--. Appropriate correction is required.
4. Claim 13 is objected to because of the following informalities: In claim 13, "the element" should be --said piezoelectric element--. Appropriate correction is required.
5. Claim 22 is objected to because of the following informalities: In claim 22, "grater" should be --greater--. Appropriate correction is required.
6. Claim 29 is objected to because of the following informalities: In claim 29, "Claim 27 or 28" should be --Claims 27 or 28--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

• Claims 1-5, 12-16, 18, 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Koshikawa et al. (hereinafter Koshikawa) (US 6,181,531 B1).

➤ Regarding claims 1, 27 and 28, Koshikawa discloses a slider assembly for a data storage device, the assembly comprising:

a slider main body [112];

a piezoelectric element [124] mounted on the slider main body [112]; and

a head [124] mounted on the piezoelectric element ;

wherein the slider main body [112] can be moved and the piezoelectric element [124] can be operated to adjust the position of the head with respect to a data storage medium [Figs, 27a-c; col. 16, lines 34-54].

➤ Regarding claim 2, Koshikawa discloses the piezoelectric element is operable to move the head in a direction generally parallel to a data-bearing surface of the data storage medium [Fig. 27b].

➤ Regarding claim 3, Koshikawa shows the piezoelectric element [124] is mounted on a trailing end of the slider main body [112] [Figs. 10a & 27b].

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➤ Regarding claim 4, Koshikawa shows the piezoelectric element [124] is connected at one end to the slider main body [112], the remainder of the element being suspended from the slider main body [Fig. 27b].

➤ Regarding claim 5, Koshikawa discloses the head [124] is mounted towards the end of the element furthest from said one end connected to said slider main body [Figs. 27a-d].

➤ Regarding claims 12-14, Koshikawa shows the slider main body [112] is provided with a notch, said piezoelectric element being located within said notch [Figs. 27a-d].

➤ Regarding claims 15, 16 and 18 Koshikawa discloses the head is a read/write head operable to read data from the data storage medium and write data to the data storage medium, said head comprising a read/write transducer [col. 16, lines 7-19].

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

• Claims 6-8, 10 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshikawa et al. (hereinafter Koshikawa) (US 6,181,531 B1) in view of Sivadasan et al. (hereinafter Sivadasan) (US 6,624,553 B2).

➤ Regarding claims 6-8 and 10, Koshikawa shows all the features described, *supra*, but does not show the slider main body being provided with a mounting pad, said one end of said

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piezoelectric element being provided with a projection affixable to said mounting pad and the piezoelectric element being generally "C"-shaped.

Sivadasan discloses a microactuator device comprising a circular C-shaped piezoelectric element having opposite ends [34, 38], wherein one end of the piezoelectric element is affixed or connected to one end of the slider [92], and the other end is affixed or connected to the flexure member [94] for obtaining movement of the head transducer to enable fine tracking of the disk.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the piezoelectric element of Kushikawa with the piezoelectric element as taught by Sivadasan.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to replace the piezoelectric element of Kushikawa with the piezoelectric element as taught by Sivadasan because they are art recognized equivalent piezoelectric elements performing the same function of positioning the magnetic head at specific radial locations on magnetic disc, in the same disk drive environment.

➤ Regarding claim 30, Koshikawa discloses a slider assembly comprising:

a slider main body [112] having a trailing end and a leading end, a notch being formed in said trailing end [Figs, 27a-d];

a piezoelectric element [124], said piezoelectric element being connected to the slider main body so that the remainder of said element is freely suspended from said slider main body; and a head mounted proximate said second end of said piezoelectric element; wherein the piezoelectric element is mounted on the slider main body so as to be wholly recessed within the notch.

Koshikawa does not show does not show the slider main body being provided with a mounting pad, said one end of said piezoelectric element being provided with a projection affixable to said mounting pad and the piezoelectric element being generally “C”-shaped.

Sivadasan discloses a microactuator device comprising a circular C-shaped piezoelectric element having opposite ends [34, 38], wherein one end of the piezoelectric element is affixed or connected to one end of the slider [92] , and the other end is affixed or connected to the flexure member [94] for obtaining movement of the head transducer to enable fine tracking of the disk.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the piezoelectric element of Koshikawa with the piezoelectric element as taught by Sivadasan.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to replace the piezoelectric element of Koshikawa with the piezoelectric element as taught by Sivadasan because they are art recognized equivalent piezoelectric elements performing the same function of positioning the magnetic head at specific radial locations on magnetic disc, in the same disk drive environment.

- Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koshikawa et al. (hereinafter Koshikawa) (US 6,181,531 B1) as applied to claim 1 above, and further in view of Wang et al. (hereinafter Wang) (US 6,653,763 B2).

- Regarding claim 9, Koshikawa shows all the features described, *supra*, but does not show the piezoelectric element being generally “S”-shaped.

Wang shows a circular piezoelectric element being “S”-shaped [col. 8, lines 48-50; Fig. 6].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the piezoelectric element of Kushikawa with the piezoelectric element as taught by Wang.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to replace the piezoelectric element of Kushikawa with the piezoelectric element as taught by Wang because they are art recognized equivalent piezoelectric elements performing the same function of positioning the magnetic head at specific radial locations on magnetic disc, in the same disk drive environment.

- Claims 11, 19-21 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshikawa et al. (hereinafter Koshikawa) (US 6,181,531 B1) as applied to claim 1 above, and further in view of Kurihara et al. (hereinafter Kurihara) (US 6,587,313 B2).

- Regarding claim 11, Koshikawa shows all the features described, *supra*, but does not show the piezoelectric element being generally spiral.

Kurihara shows a disk drive system, wherein the circular piezoelectric element is shaped like a spiral for large head movement for increased off track correction and higher recording density [col. 1, lines 48-56; Fig. 3].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the piezoelectric element of Kushikawa with the piezoelectric element as taught by Kurihara.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to replace the piezoelectric element of Kushikawa with the piezoelectric element as taught by Kurihara because they are art recognized equivalent

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piezoelectric elements performing the same function of positioning the magnetic head at specific radial locations on magnetic disc, in the same disk drive environment.

➤ Regarding claims 19-21 and 24, Koshikawa shows all the features described, *supra*, but does not show an arm connected at one end to the slider assembly; and

a motor operable to rotate the arm about a pivot point to move the slider assembly back and forth over a data storage medium, wherein the motor is operable to adjust the position of the head with respect to the data storage medium by rotating the arm, and the piezoelectric element of the slider assembly is operable to adjust the position of the head with respect to the data storage medium.

Kurihara shows a disk drive system comprising: an arm [106] connected at one end to the slider assembly and a voice coil motor [107] operable to rotate the arm about a pivot point [105] to move the slider assembly [104] back and forth over a data storage medium [103], wherein the motor [107] is operable to adjust the position of the head with respect to the data storage medium by rotating the arm, and the piezoelectric element of the slider assembly is operable to adjust the position of the head with respect to the data storage medium [Fig. 1].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the slider assembly of Koshikawa to the disk drive system as taught by Kurihara.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to add the slider assembly of Koshikawa to the disk drive system as taught by Kurihara in order to extract the information recorded on the magnetic disk [Kurihara; col. 6, lines 6-27].

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➤ Regarding claims 25 and 26, Koshikawa shows all the features described, *supra*, but does not show a platter carrying a magnetic data storage medium, a first control circuit operable to control the motor, a second control circuit operable to control the piezoelectric element and an input/output interface for input of signals to and output of signals from the hard disk data storage device.

Kurihara teaches a platter carrying a magnetic data storage medium [Fig. 1], a first control circuit operable to control the motor [col. 6, lines 6-27], a second control circuit operable to control the piezoelectric element [col. 7, line 50 to col. 8, line 8] and an input/output interface for input of signals to and output of signals from the hard disk data storage device [col. 6, lines 6-27].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the slider assembly of Koshikawa to the disk drive system as taught by Kurihara.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to add the slider assembly of Koshikawa to the disk drive system as taught by Kurihara in order to extract the information recorded on the magnetic disk [Kurihara; col. 6, lines 6-27].

Allowable Subject Matter

9. Claims 17, ~~4~~ 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Magee whose telephone number is (703) 605-4256. The examiner can normally be reached on M-F, 8: 00 am-5: 30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 13, 2004



Christopher R. Magee
Patent Examiner
Art Unit 2653

A. J. HEINZ
PRIMARY EXAMINER
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